APPENDIX F

Address Calculation Sort

Write a program to sort elements of an array using address calculation sort.

```
#include <stdio.h>
#include <stdlib.h>
#define MAX 5
struct node
{
    int data;
    struct node *next;
}*nodes[10]={NULL};

struct node *insert(struct node *start, int num)
{
    struct node *ptr,*new_node;
    ptr=start;
    new_node = (struct node*)malloc(sizeof(struct node));
    new_node->data=num;
    new_node->next=NULL;
    if(start==NULL)
        start = new_node;
    else
    {
        //insert the new node at its right position
        while((ptr->next->data<=num) && (ptr->next!=NULL))
            ptr=ptr->next;
        if(new_node->data < ptr->data)
        {
            new_node->next=ptr;
            start=new_node;
        }
        else
        {
            new_node->next=ptr->next;
            ptr->next=new_node;
        }
    }
    return start;
}
void addr_calc_sort(int arr[],int n)
{
    int i,j=0,pos;
    for(i=0;i<n;i++)
    {
        pos = arr[i] / 10;
```

```
        nodes[pos]=insert(nodes[pos],arr[i]);
    }
    for(i=0;i<10;i++)
    {
        while(nodes[i]!=NULL)
        {
            arr[j++]=nodes[i]->data;
            nodes[i]=nodes[i]->next;
        }
    }
    printf("\nSorted output is: ");
    for(i=0;i<n;i++)
        printf("%d\t",arr[i]);
    getch();
}
void main()
{
    int arr[MAX],i,n;
    printf("\n Enter the number of elements : ");
    scanf("%d",&n);
    printf("\n Enter the elements : ");
    for(i=0;i<n;i++)
        scanf("%d",&arr[i]);
    addr_calc_sort(arr,n);
}
```

Output

```
Enter the number of elements : 5
Enter the elements: 23  53  14  78  22
Sorted output is : 14  22  23  53  78
```